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ET Docket 04-186



Institute for
Infocomm Research

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Dec 05, 2007.

DEC 10 2007

Ex-Parte

ORIGINAL

Federal Communications Commission
Office of the Secretary

Office of Engineering and Technology
Federal Communications Commissions
445 12th Street, SW
Washington, DC 20554

Dear Sir/Madam,

Re: FCC Public Notice dated 5th October 2007 - ET Docket No. 04-186

We refer to the public notice issued by FCC on 5th Oct 2007 (ET Docket No. 04-186), and submit a summary description of a device that we would like to submit to the FCC for testing.

We plan to submit two identical white-space devices to FCC. Attached is the document containing the technical description of our device.

Please also let us know if any other information is required by the FCC in order to test the device. We are prepared to provide any technical assistance to ensure successful field testing of the devices.

Should you have any queries, please do not hesitate to contact the undersigned at swoh@i2r.a-star.edu.sg or (65) 68741948.

Yours truly,

Dr. Oh Ser Wah
Project Manager
Institute for Infocomm Research

Enc.





I²R White-Space Device

1. System Overview

The Institute for Infocomm Research (I²R) white-space device is a platform with integrated hardware and software components for exploring possible white space within the TV bands. It is part of a longer term vision for cognitive radio (CR) realization.

The device is capable of detecting any signal that is present at the designated bands regardless of which standard it follows (i.e., blind detection). Since the method used is based on blind detection, no classification of signal type is supported in this version.

In a single capture, the device performs signal sensing through two schemes, namely Cav 1 and Cav 2. These two schemes use different algorithms and two separate results are output to the screen.

This device does not include a radio transmitter.

Key components of the device as shown in Figure 1 include:

1. Omni-directional antenna
 - For receiving RF signal
 - Passive
2. TV tuner (commercial off-the-shelf from Freescale)
 - Receiving TV RF signal and translating to IF
 - Auto-configuration through GUI
3. Mixed-signal and digital processing boards (inside the PC)
 - Performing ADC/DAC, digital down conversion and filtering
 - Implementation on Xilinx FPGA and TI DSP
4. Computer
 - Configuration and graphical user interface
 - Report generation

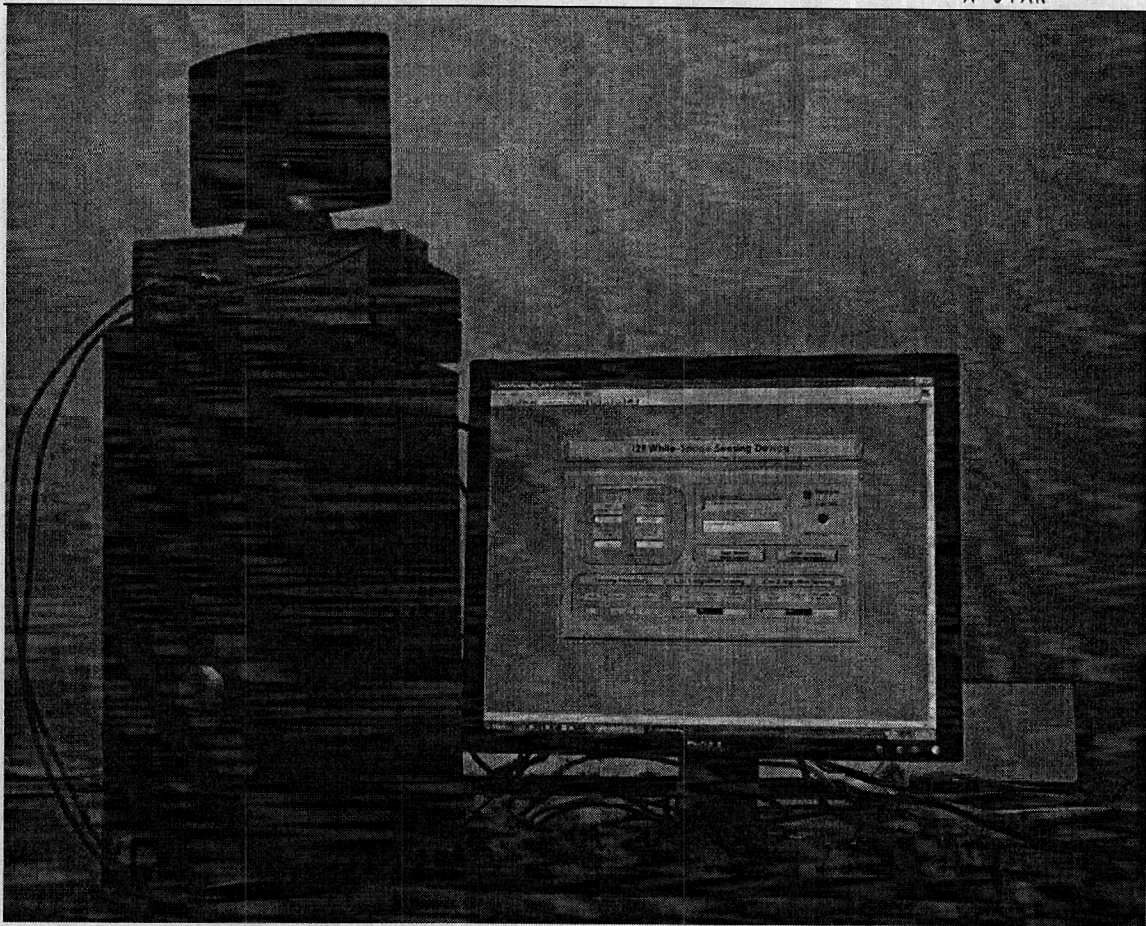


Figure 1: I²R white-space sensing device

2. System Specifications

5 2.1. System

Item	Parameter
Dynamic range	Calibrated from -50dBm to up to -116dBm for TV signals Calibrated from -50dBm to up to -122dBm for Wireless MIC
Captured data time	~200ms
Processing time	Real time
Field test	Yes

2.2. Antenna

Item	Parameter
Frequency range	470MHz – 860MHz
Gain	4dBi

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2.3. TV Tuner

Item	Parameter
Frequency range	48MHz – 1000MHz
Channel raster	250kHz
Bandwidth supported	6MHz

2.4. Baseband

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Item	Parameter
ADC	14 bits
Supported signal	Any (blind)
Algorithm	Cav 1 and Cav 2 algorithms
Signal classification	No
Automatic gain control	No
Interface to PC	PCI (inside PC)

3. User Interface

3.1. Graphical User Interface

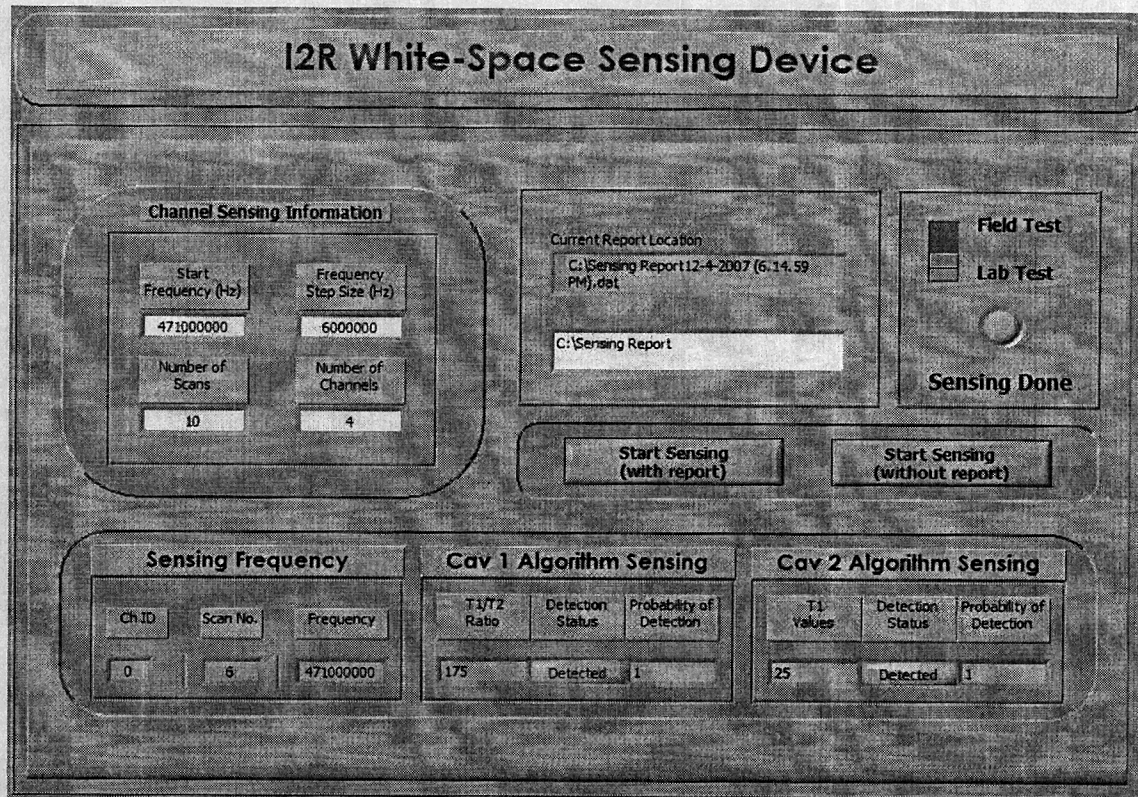


Figure 2: Graphical user interface for configuring the device and displaying of sensing results

10 The graphical user interface (GUI) communicates to the TI DSP through RTDX interface. It allows the following functions:

1. Configuration of start frequency, frequency step, number of channels, number of scans and filename and path for the report
2. Selection of field test or lab test
- 15 3. Calculation of probability of detection in real time
4. Report will be generated in files
5. Report generation can be enabled or disabled
6. LED to indicate completion of sensing

20 3.2. Report

1. Includes
 - o Channel ID
 - o Frequency being scanned

- Cav 1
 1. Value
 2. Detection status (1 = signal present, 0 = no signal present)
 3. Probability of detection

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- Cav 2
 1. Value
 2. Detection status (1 = signal present, 0 = no signal present)
 3. Probability of detection

2. Example output file

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○ Ch ID:           0,           0,           0,           0,           ...
Freq (MHz):       583,         583,         583,         583,         ...
Cav1 Detect:       1,           1,           1,           1,           ...
Cav1 Value:        43,          50,          46,          51,          ...
Cav1 Pd: 1.00000
Cav2 Detect:       1,           1,           1,           1,           ...
Cav2 Value:       158,         158,         158,         158,         ...
Cav2 Pd: 1.00000
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3. The output file may be imported into Microsoft Excel by using ',' and ':' as separators for post-processing, if required.

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4. Contacts

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